



April 6, 2011

Ms. Julie M. Van Horn, Senior Assistant Regional Counsel
EPA Region 7
901 North 5th Street
Kansas City, Kansas 66101

Re: BLR Redevelopment Corporation
4327 Gustine Avenue
St. Louis, Missouri 63116

Dear Ms. Horn:

In accordance with the Monday, March 28, 2011 conference call relative to the Ray Avenue Superfund Site and your subsequent e-mail, attached is the requested *Interim Technical Memorandum* for the BLR Redevelopment Corporation portion of the site. As indicated no additional sampling of the site will be required. Based upon the available data, a "Streamlined Risk Evaluation" is to be performed. The enclosed memorandum addresses the methods and data that will be utilized to calculate the exposure point concentrations.

The requested risk estimates will be presented in a report within sixty (60) days of receipt of approval of the enclosed memorandum.

If you have any additional questions and/or comments, please address them to the writer at the address below. We look forward to continue to work with you and your staff on this matter.

Sincerely yours,

A handwritten signature in cursive script, appearing to read 'Walter G. Shifrin'.

Walter G. Shifrin, P.E., President

WGS:mkh
Enclosure

cc: Mr. Harry T. Bussmann, III

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**INTERIM TECHNICAL MEMORANDUM
BLR REDEVELOPMENT CORPORATION
4327 GUSTINE AVENUE
ST. LOUIS, MISSOURI 63116**

April 6, 2011

prepared by

Shifrin & Associates, Inc.
230 S. Bemiston Avenue
St. Louis, Missouri 63105

314-721-2249

Purpose

This memorandum is prepared for submittal to the U.S. Environmental Protection Agency ("EPA" or "Agency"), Region 7, Kansas City, Kansas for approval of factors to be utilized in preparation of a streamlined risk evaluation for the subject site, which is a portion of the parcel known as 4327 Gustine Avenue. Figures 1 and 2 attached hereto show the extent of the property under consideration, which has an area of about 0.7 acres.

Conceptual Site Model

Based upon the August 31, 2009 Site Characterization report prepared by Shifrin for the subject property and the projected future use of the property, a conceptual model for the site has been prepared. The results of the proposed soil sampling were presented in an August 31, 2009 report, which was submitted to the Agency. Attached are Table Nos. 1 through 4, inclusive, which have been revised to include the Regional Screening Levels ("RSLs") for Chemical Contaminants at Superfund Site developed by EPA Region 9.

The property is currently occupied by an unoccupied former chemical building, which was part of a manufacturing and warehouse complex, which occupies the entire parcel. It is assumed that the property will remain non-residential and that no buildings will be constructed on the subject portion of the property. Most of the property under consideration is paved with asphalt, as indicated in the Site Characterization report.

As indicated in the Work Plan for the Site Characterization report, it was found during prior environmental investigations and actions on the site that the depth to groundwater was greater than 15-feet below ground surface. Further, the City of St. Louis has adopted an Ordinance 66777, a copy of which is attached as Exhibit I, which prohibits the installation of groundwater wells and the use of groundwater in the City for potable water. Therefore, the groundwater samples were not obtained during the Site

Characterization and all groundwater exposure pathways are incomplete.

The completed on-site pathways for analysis of the site are as follows:

- Commercial/Industrial Outdoor Workers
 - Dermal Contact/Ingestion/Particulate Inhalation of Soils
 - Vapor Inhalation (Ambient)
- Construction Worker
 - Dermal Contact/Ingestion/Particulate Inhalation of Soils
 - Vapor Inhalation (Ambient)

The maximum concentration of each chemical of concern will be utilized in analyzing the site. Representative concentrations will not be calculated. The data from analyses of soil samples collected during the site characterization effort in 2009 have been tabulated in the attached Table Nos. 1 through 6, inclusive. In order to determine the chemicals of concern on the site, the values have been compared to the RSLs. These RSLs were calculated using a 10^{-6} risk level for carcinogens and a Hazard Quotient of 0.1 for non-carcinogens. Based upon these comparisons, only the following chemicals of concern will be evaluated in determining the risk on the site:

Chemical of Concern	Maximum Concentration (mg/kg)
Benzo(a)anthracene	875
Benzo(a)pyrene	1,050
Benzo(b)fluoranthene	1,180
Benzo(k)fluoranthene	390. J
Chrysene	905
Dibenzo(a,h)anthracene	190. J
Indeno(1,2,3-cd)pyrene	635
Arsenic	10.4

It is our opinion that although the concentration of arsenic exceeds the RSL and is a carcinogen, it should be deleted from further consideration since these concentrations are below background concentrations in Missouri. The *Geochemical Survey of Missouri - Geological Survey Professional Paper 954-H,I* published by the U.S. Department of Interior in 1984 indicates that the geometric mean concentration of arsenic in agricultural soils in the State is 8.7 parts per million of mg/kg. Therefore, since the concentrations of arsenic in samples collected in 2009 ranged from less than 2.50 mg/kg to 8.62 mg/kg in surficial soils and 2.3 to 10.4 mg/kg in subsurface samples, it is our opinion that the arsenic

present on the site is background in nature.

Exposure Factor

Using software developed by the RAM Group for the Missouri Department of Natural Resources, the Individual Excess Lifetime Cancer Risk ("IELCR") and the Hazard Index and Hazard Quotient will be determined for each chemical of concern with a maximum concentration greater than the RSL.

The following exposure factor values will be used in determination of risk:

Commercial/Industrial Outdoor Worker

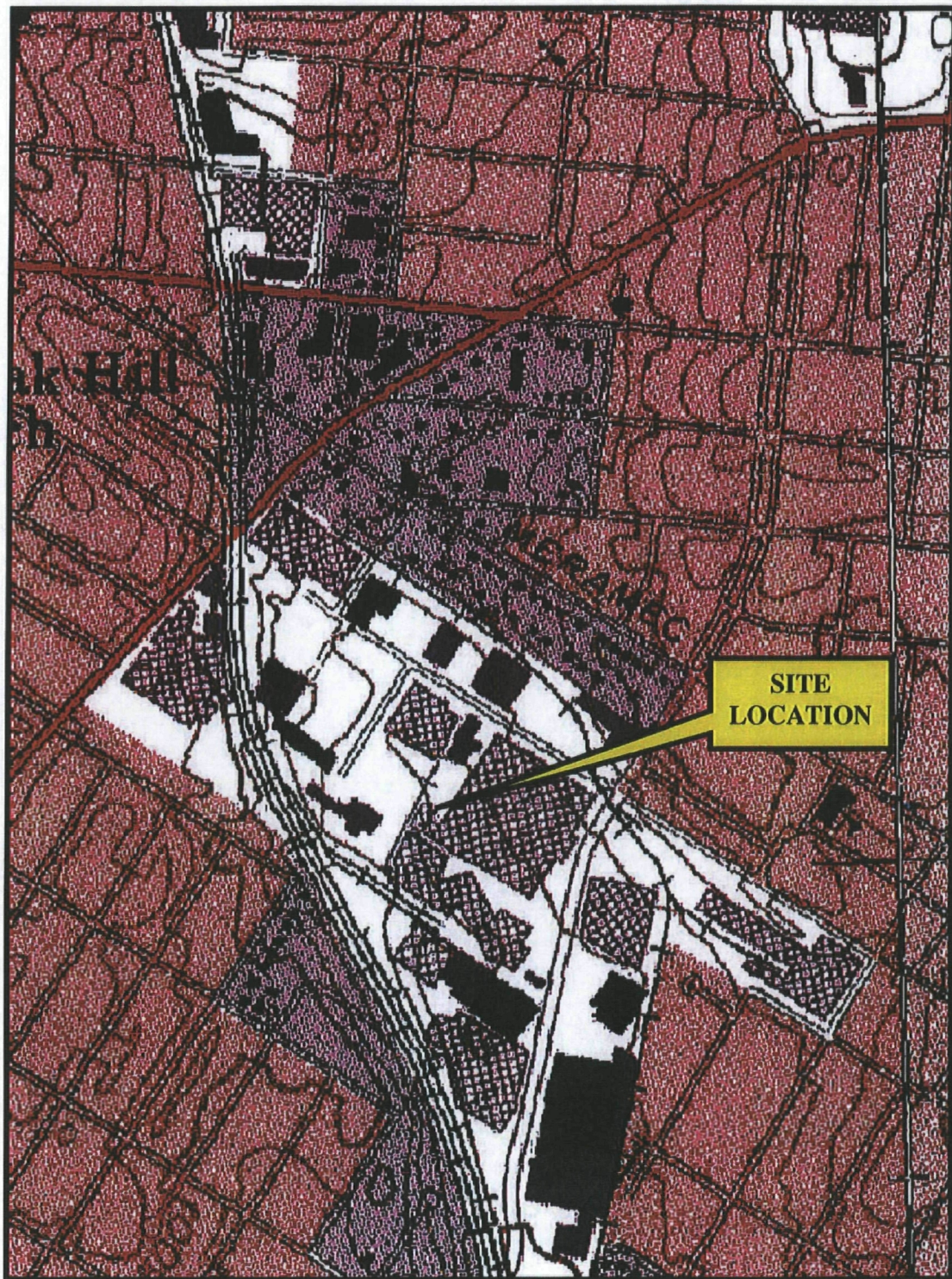
• Average Time for Carcinogen (AT_c)	70 years
• Average Time for Non-Carcinogen (AT_{nc})	25 years
• Body Weight (BW)	70 kg
• Exposure Duration (ED)	25 years
• Exposure Frequency (EF)	250 days/year
• Soil Ingestion Rate (IR_{soil})	100 mg/day
• Outdoor Inhalation Rate (IR_{ao})	0.833 m ³ /hour
• Exposure Time for Outdoor Inhalation (ET_{out})	6 hours/day
• Outdoor Inhalation Rate (IR_a)	5 m ³ /day
• Skin Surface Area for Dermal Contact (SA)	3300 cm ² /day
• Soil to Skin Adherence Factor (M)	0.2 mg/cm ³
• Event Frequency Dermal Contact with Soils (EV_{soil})	1 event/day

Construction Worker

• Average Time for Carcinogen (AT_c)	70 years
• Average Time for Non-Carcinogen (AT_{nc})	1 year
• Body Weight (BW)	70 kg
• Exposure Duration (ED)	1 year
• Exposure Frequency (EF)	90 days/year
• Soil Ingestion Rate (IR_{soil})	100 mg/day
• Outdoor Inhalation Rate (IR_{ao})	1.800 m ³ /hour
• Exposure Time for Outdoor Inhalation (ET_{out})	10 hours/day
• Outdoor Inhalation Rate (IR_a)	18 m ³ /day
• Skin Surface Area for Dermal Contact (SA)	3300 cm ² /day
• Soil to Skin Adherence Factor (M)	0.3 mg/cm ³
• Event Frequency Dermal Contact with Soils (EV_{soil})	1 event/day

Toxicity Values

The physical, chemical and toxicity properties for the seven (7) chemicals of concern, which will be utilized in determination of risk, are attached in Exhibit II.



SOURCE: USGS QUADRANGLE MAP – TERRASERVER USA

FIGURE 1: SITE LOCATION

DATE: 03-09-09

SCALE: 1" = 600'

SHIFRIN & ASSOCIATES, INC.
Environmental Engineers
230 S. Barnhart • Suite 305 • St. Louis, MO 63105

4301 GUSTINE AVENUE

ST. LOUIS, MISSOURI



FIGURE 2: SUBJECT PROPERTY

DATE: 03-02-09

SCALE: NOT TO SCALE

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4301 GUSTINE AVENUE

ST LOUIS, MISSOURI

TABLE NO. 1
RESULTS OF ANALYSES OF SURFICIAL SOIL SAMPLES
SEMI-VOLATILE ORGANIC COMPOUNDS
4327 GUSTINE AVENUE
ST. LOUIS, MISSOURI

ANALYTE	D - 1	D - 2	D - 3	D - 4	D - 5	EPA RSLs
	0' - 3'	0' - 3'	0' - 3'	0' - 3'	0' - 3'	
Acenaphthene	<9.12	<181	<2.10	<222	<0.454	3,300
Anthracene	<9.12	<181	<2.10	<222	<0.454	17,000
Benzo(a)anthracene	8.7 J	<181	<2.10	120. J	<0.454	2.1
Benzo(a)pyrene	9.81	<181	<2.10	100. J	<0.454	0.21
Benzo(b)fluoranthene	12.6	47. J	<2.10	98. J	<0.454	2.1
Benzo(g,h,i)perylene	6.4 J	<181	<2.10	<222	<0.454	
Benzo(k)fluoranthene	3.3 J	<181	<2.10	<222	<0.454	21
Chrysene	11.1	<181	<2.10	100. J	<0.454	210
Dibenzo(a,h)anthracene	<9.12	<181	<2.10	<222	<0.454	0.21
Fluoranthene	16.1	69. J	0.93 J	253	<0.454	2,200
Fluorene	<9.12	<181	<2.10	<222	<0.454	2,200
Indeno(1,2,3-cd)pyrene	5.3 J	<181	<2.10	<222	<0.454	2.1
Phenanthrene	5.2 J	<181	<2.10	110. J	<0.454	
Pyrene	14.3	56. J	0.72 J	200. J	<0.649	1,700

NOTES:

- All values are presented in mg/kg or parts per million ("ppm")
- Bold concentrations exceed the laboratory reporting limit or are estimated
- J = Analyte detected below the laboratory detection limit
- Bold analytes are carcinogenic; non-bold are non-carcinogenic
- EPA RSLs = Regional Screening Level for Industrial Soil for risk of 10^{-6} ; non-carcinogenic RSLs are for Hazard Quotient of 0.1
- Gray shaded values exceed the RSL

TABLE NO. 2
RESULTS OF ANALYSES OF SUBSURFACE SOIL SAMPLES
SEMI-VOLATILE ORGANIC COMPOUNDS
4327 GUSTINE AVENUE
ST. LOUIS, MISSOURI

ANALYTE	D - 1		D - 2		D - 3	EPA RSLs
	4' - 8'	8' - 11'	3' - 7'	12' - 15'	3' - 5'	
Acenaphthene	0.76 J	0.477	68. J	<0.430	<510	3,300
Anthracene	<2.28	<0.455	140. J	<0.430	<510	17,000
Benzo(a)anthracene	<2.28	<0.455	367	<0.430	758	2.1
Benzo(a)pyrene	<2.28	<0.455	299	<0.430	869	0.21
Benzo(b)fluoranthene	<2.28	<0.455	321	<0.430	1,020	2.1
Benzo(g,h,i)perylene	<2.28	<0.455	160. J	<0.430	517	
Benzo(k)fluoranthene	<2.28	<0.455	110. J	<0.430	370. J	21
Chrysene	<2.28	<0.455	330	<0.430	806	210
Dibenzo(a,h)anthracene	<2.28	<0.455	<195	<0.430	140. J	0.21
Fluoranthene	<2.28	0.18 J	870	0.26 J	1,050	2,200
Fluorene	1.1 J	0.671	<195	<0.430	<510	2,200
Indeno(1,2,3-cd)pyrene	<2.28	<0.455	140. J	<0.430	470. J	2.1
Phenanthrene	<2.28	<0.455	615	0.26 J	310. J	
Pyrene	0.91 J	0.32 J	729	0.23 J	998	1,700

NOTES:

- All values are presented in mg/kg or parts per million ("ppm")
- Bold concentrations exceed the laboratory reporting limit or are estimated
- J = Analyte detected below the laboratory detection limit
- Bold analytes are carcinogenic; non-bold are non-carcinogenic
- EPA RSLs = Regional Screening Level for Industrial Soil for risk of 10⁻⁶; non-carcinogenic RSLs are for Hazard Quotient of 0.1
- Gray shaded values exceed the RSL

TABLE NO. 2 (continued)
RESULTS OF ANALYSES OF SUBSURFACE SOIL SAMPLES
SEMI-VOLATILE ORGANIC COMPOUNDS
4327 GUSTINE AVENUE
ST. LOUIS, MISSOURI

ANALYTE	D - 4				D - 5		EPA RSLs
	0' - 3'	4' - 8'	8' - 12'	8' - 12' ("1")	4' - 8'	12' - 15'	
Acenaphthene	<222	0.15 J	<2.25	<0.446	<587	<0.431	3,300
Anthracene	<222	0.19 J	<2.25	0.19 J	<587	<0.431	17,000
Benzo(a)anthracene	120. J	0.32 J	2.29	0.41 J	875	<0.431	2.1
Benzo(a)pyrene	100. J	0.28 J	2.47	0.42 J	1,050	<0.431	0.21
Benzo(b)fluoranthene	98. J	0.27 J	2.56	0.39 J	1,180	0.12 J	2.1
Benzo(g,h,i)perylene	<222	0.21 J	1.6 J	0.31 J	740	<0.431	
Benzo(k)fluoranthene	<222	0.13 J	1.4 J	0.21 J	390. J	<0.431	21
Chrysene	100. J	0.29 J	2.68	0.37 J	905	<0.431	210
Dibenzo(a,h)anthracene	<222	<0.448	<2.25	<0.446	190. J	<0.431	0.21
Fluoranthene	253	0.834	3.62	0.961	1,230	<0.431	2,200
Fluorene	<222	<0.448	<2.25	<0.446	<587	<0.431	2,200
Indeno(1,2,3-cd)pyrene	<222	0.16 J	1.4 J	0.24 J	635	<0.431	2.1
Phenanthrene	110. J	0.744	1.4 J	0.760	300. J	<0.431	
Pyrene	200. J	0.718	3.0 J	0.904	1,060	<0.616	1,700

NOTES:

- All values are presented in mg/kg or parts per million ("ppm")
- Bold concentrations exceed the laboratory reporting limit or are estimated
- J = Analyte detected below the laboratory detection limit
- Bold analytes are carcinogenic; non-bold are non-carcinogenic
- EPA RSLs = Regional Screening Level for Industrial Soil for risk of 10^{-6} ; non-carcinogenic RSLs are for Hazard Quotient of 0.1
- Gray shaded values exceed the RSL

TABLE NO. 3
RESULTS OF ANALYSES OF SURFICIAL SOIL SAMPLES - VOLATILE ORGANIC COMPOUNDS
4327 GUSTINE AVENUE
ST. LOUIS, MISSOURI

ANALYTE	D - 1	D - 2	D - 3	D - 4	D - 5	EPA RSLs
	(0' - 3')	(0' - 3')	(0' - 3')	(0' - 3')	(0' - 3')	
1,1,1-Trichloroethane	<0.0043	<0.0042	0.0037 J	<0.0081	<0.0054	3,800
1,1,2-Trichloroethane	<0.0043	<0.0042	<0.0045	<0.0081	<0.0054	5.3
1,1-Dichloroethane	<0.0043	0.0009 J	<0.0045	<0.0081	<0.0054	17.0
1,1-Dichloroethene	<0.0043	<0.0042	<0.0045	<0.0081	<0.0054	110
1,2,3-Trimethylbenzene	0.0010 J	0.0021 J	<0.0045	<0.0081	<0.0054	---
1,2,4-Trimethylbenzene	0.0038 J	0.0059	<0.0045	0.0052 J	0.0018 J	26
1,3,5-Trimethylbenzene	0.0013 J	0.0014 J	<0.0045	0.0017 J	<0.0054	1,000
2-Butanone (MEK)	<0.0430	<0.0416	<0.0451	<0.0810	0.0747	20,000
2-Chlorotoluene	<0.0043	<0.0042	<0.0045	<0.0081	0.0036 J	2,000
4-Chlorotoluene	<0.0043	<0.0042	<0.0045	<0.0081	<0.0054	7,200
Acetone	0.010 J	0.018 J	0.011 J	0.042 J	0.365	63,000
Benzene	<0.0009	0.0009	<0.0009	<0.0016	0.0397	5.4
Carbon Tetrachloride	<0.0043	<0.0042	<0.0045	<0.0081	<0.0054	3.0
Chlorobenzene	<0.0043	<0.0042	<0.0045	<0.0081	0.0012 J	140
Chloroethane	<0.0086	<0.0083	<0.0090	<0.0162	0.0118	---
Chloroform	<0.0043	<0.0042	<0.0045	<0.0081	<0.0054	1.5
Chloromethane	<0.0086	<0.0083	<0.0090	<0.0162	<0.0108	50
Ethylbenzene	0.0009 J	0.0014 J	<0.0045	0.0022 J	0.0183	27
Heptane	<0.0172	<0.0166	<0.0180	<0.0324	0.0713	---
Isopropylbenzene	<0.0043	<0.0042	<0.0045	<0.0081	<0.0054	1,100
m,p-Xylenes	0.0031 J	0.0042	<0.0045	0.0065 J	0.0169	1,700
Methylene Chloride	0.0010 J	<0.0042	<0.0045	0.0038 J	0.0042 J	53
Naphthalene	0.0210	0.0042 J	<0.0090	0.594	<0.0108	18
n-Butylbenzene	0.0015 J	<0.0042	<0.0045	<0.0081	<0.0054	---
n-Hexane	<0.0172	<0.0166	<0.0180	<0.0324	0.0596	260
n-Propylbenzene	<0.0043	0.0011 J	<0.0045	<0.0081	0.0048 J	2,100
o-Xylene	0.0017 J	0.0020 J	<0.0045	0.0033 J	0.0028 J	1,900
sec-Butylbenzene	0.0027 J	0.0009 J	<0.0045	<0.0081	<0.0054	---
tert-Butylbenzene	<0.0043	<0.0042	<0.0045	<0.0081	<0.0054	---
Toluene	0.0022 J	0.0024 J	<0.0045	0.0039 J	0.0067	4,500

TABLE NO. 3 (continued)
RESULTS OF ANALYSES OF SURFICIAL SOIL SAMPLES - VOLATILE ORGANIC COMPOUNDS
4327 GUSTINE AVENUE
ST. LOUIS, MISSOURI

NOTES:

- All values are presented in mg/kg or parts per million ("ppm")
- Bold concentrations exceed the laboratory reporting limit or are estimated
- J = Analyte detected below the laboratory detection limit
- Bold analytes are carcinogenic; non-bold are non-carcinogenic
- EPA RSLs = Regional Screening Level for Industrial Soil for risk of 10^{-6} ; non-carcinogenic RSLs are for Hazard Quotient of 0.1
- Gray shaded values exceed the RSL

TABLE NO. 4
RESULTS OF ANALYSES OF SUBSURFACE SOIL SAMPLES - VOLATILE ORGANIC COMPOUNDS
4327 GUSTINE AVENUE
ST. LOUIS, MISSOURI

ANALYTE	D - 1		D - 2		EPA RSLs
	4' - 8'	8' - 11'	3' - 7'	12' - 15'	
1,1,1-Trichloroethane	<0.0049	<0.138	0.0063	0.0222	3,800
1,1,2-Trichloroethane	<0.0049	0.060 J	<0.0042	<0.0043	5.3
1,1-Dichloroethane	<0.0049	<0.138	<0.0042	0.0014 J	17.0
1,1-Dichloroethene	<0.0049	<0.138	<0.0042	<0.0043	110
1,2,3-Trimethylbenzene	<0.0049	<0.138	<0.0042	<0.0043	---
1,2,4-Trimethylbenzene	<0.0049	<0.138	<0.0042	0.0015 J	26
1,3,5-Trimethylbenzene	<0.0049	<0.138	<0.0042	<0.0043	1,000
2-Butanone (MEK)	0.015 J	<1.380	<0.0420	0.012 J	20,000
2-Chlorotoluene	<0.0049	<0.138	<0.0042	0.0319	2,000
4-Chlorotoluene	<0.0049	<0.138	<0.0042	0.0118	7,200
Acetone	0.0579	<1.380	0.0085 J	0.019 J	63,000
Benzene	<0.0010	<0.0276	<0.0008	0.0170	5.4
Carbon Tetrachloride	<0.0049	<0.138	<0.0042	0.0034 J	3.0
Chlorobenzene	<0.0049	<0.138	<0.0042	0.0026 J	140
Chloroethane	<0.0098	<0.276	<0.0084	<0.0086	---
Chloroform	<0.0049	<0.138	<0.0042	<0.0043	1.5
Chloromethane	<0.0098	0.082 J	<0.0084	<0.0086	50
Ethylbenzene	<0.0049	<0.138	<0.0042	<0.0043	27
Heptane	<0.0196	<0.552	<0.0168	0.0043 J	---
Isopropylbenzene	0.0076	0.272	<0.0042	<0.0043	1,100
m,p-Xylenes	<0.0049	<0.138	0.0011 J	0.0022 J	1,700
Methylene Chloride	<0.0049	<0.138	0.0008 J	0.0015 J	53
Naphthalene	<0.0098	<0.276	<0.0084	<0.0086	18
n-Butylbenzene	<0.0049	1.690	<0.0042	<0.0043	---
n-Hexane	<0.0196	<0.552	<0.0168	0.013 J	260
n-Propylbenzene	0.0069	0.373	<0.0042	0.0207	2,100
o-Xylene	<0.0049	<0.138	<0.0042	0.0009 J	1,900
sec-Butylbenzene	0.187	2.770	<0.0042	<0.0043	---
tert-Butylbenzene	0.0098	<0.138	<0.0042	<0.0043	---
Toluene	0.0014 J	<0.138	<0.0042	0.0080	4,500

TABLE NO. 4 (continued)
RESULTS OF ANALYSES OF SUBSURFACE SOIL SAMPLES - VOLATILE ORGANIC COMPOUNDS
4327 GUSTINE AVENUE
ST. LOUIS, MISSOURI

ANALYTE	D - 3	D - 4			EPA RSLs
	3' - 5'	4' - 8'	8' - 12'	8' - 12' ("1")	
1,1,1-Trichloroethane	0.123	<0.0049	<0.0046	<0.0046	3,800
1,1,2-Trichloroethane	<0.0043	<0.0049	<0.0046	<0.0046	5.3
1,1-Dichloroethane	0.0200	<0.0049	<0.0046	<0.0046	17.0
1,1-Dichloroethene	0.0030 J	<0.0049	<0.0046	<0.0046	110
1,2,3-Trimethylbenzene	0.0010 J	<0.0049	<0.0046	<0.0046	---
1,2,4-Trimethylbenzene	0.0037 J	0.0032 J	0.0060	0.0012 J	26
1,3,5-Trimethylbenzene	0.0026 J	<0.0049	0.0017 J	<0.0046	1,000
2-Butanone (MEK)	<0.0425	0.013 J	0.016 J	0.011 J	20,000
2-Chlorotoluene	<0.0043	0.0495	<0.0046	<0.0046	2,000
4-Chlorotoluene	<0.0043	0.0116	<0.0046	<0.0046	7,200
Acetone	<0.0425	0.039 J	0.0663	0.0587	63,000
Benzene	<0.0009	0.0331	<0.0009	<0.0009	5.4
Carbon Tetrachloride	0.0183	<0.0049	<0.0046	<0.0046	3.0
Chlorobenzene	<0.0043	0.0010 J	<0.0046	<0.0046	140
Chloroethane	<0.0085	<0.0099	<0.0091	<0.0093	---
Chloroform	0.0017 J	<0.0049	<0.0046	<0.0046	1.5
Chloromethane	<0.0085	<0.0099	<0.0091	<0.0093	50
Ethylbenzene	<0.0043	0.0024 J	<0.0046	<0.0046	27
Heptane	<0.0170	0.0064 J	0.0183	<0.0185	---
Isopropylbenzene	<0.0043	<0.0049	<0.0046	<0.0046	1,100
m,p-Xylenes	0.0035 J	0.0029 J	0.0027 J	0.0015 J	1,700
Methylene Chloride	0.0016 J	0.0029 J	0.0031 J	0.0030 J	53
Naphthalene	0.0262	0.0022 J	0.0181	0.0030 J	18
n-Butylbenzene	<0.0043	<0.0049	0.0033 J	<0.0046	---
n-Hexane	<0.0170	0.017 J	0.0019 J	<0.0185	260
n-Propylbenzene	<0.0043	0.0322	<0.0046	<0.0046	2,100
o-Xylene	0.0027 J	0.0016 J	0.0017 J	<0.0046	1,900
sec-Butylbenzene	<0.0043	<0.0049	<0.0046	<0.0046	---
tert-Butylbenzene	<0.0043	<0.0049	<0.0046	<0.0046	---
Toluene	0.0017 J	0.0130	0.0012 J	0.0011 J	4,500

TABLE NO. 4 (continued)
RESULTS OF ANALYSES OF SUBSURFACE SOIL SAMPLES - VOLATILE ORGANIC COMPOUNDS
4327 GUSTINE AVENUE
ST. LOUIS, MISSOURI

ANALYTE	D - 5			EPA RSLs
	4' - 8'	12' - 15'		
1,1,1-Trichloroethane	<0.0049	<0.0101		3,800
1,1,2-Trichloroethane	<0.0049	<0.0101		5.3
1,1-Dichloroethane	<0.0049	<0.0101		17.0
1,1-Dichloroethene	<0.0049	<0.0101		110
1,2,3-Trimethylbenzene	<0.0049	<0.0101		---
1,2,4-Trimethylbenzene	<0.0049	<0.0101		26
1,3,5-Trimethylbenzene	<0.0049	<0.0101		1,000
2-Butanone (MEK)	<0.0489	<0.101		20,000
2-Chlorotoluene	<0.0049	<0.0101		2,000
4-Chlorotoluene	<0.0049	<0.0101		7,200
Acetone	0.019 J	<0.101		63,000
Benzene	<0.0010	<0.0020		5.4
Carbon Tetrachloride	<0.0049	<0.0101		3.0
Chlorobenzene	<0.0049	<0.0101		140
Chloroethane	<0.0098	<0.0203		---
Chloroform	0.0014 J	<0.0101		1.5
Chloromethane	<0.0098	<0.0203		50
Ethylbenzene	<0.0049	<0.0101		27
Heptane	<0.0195	<0.0405		---
Isopropylbenzene	<0.0049	<0.0101		1,100
m,p-Xylenes	<0.0049	<0.0101		1,700
Methylene Chloride	0.0016 J	<0.0101		53
Naphthalene	0.0073 J	<0.0203		18
n-Butylbenzene	<0.0049	<0.0101		---
n-Hexane	<0.0195	<0.0405		260
n-Propylbenzene	<0.0049	<0.0101		2,100
o-Xylene	<0.0049	<0.0101		1,900
sec-Butylbenzene	<0.0049	<0.0101		---
tert-Butylbenzene	<0.0049	<0.0101		---
Toluene	<0.0049	<0.0101		4,500

TABLE NO. 4 (continued)
RESULTS OF ANALYSES OF SUBSURFACE SOIL SAMPLES - VOLATILE ORGANIC COMPOUNDS
4327 GUSTINE AVENUE
ST. LOUIS, MISSOURI

NOTES:

- All values are presented in mg/kg or parts per million ("ppm")
- Bold concentrations exceed the laboratory reporting limit or are estimated
- J = Analyte detected below the laboratory detection limit
- Bold analytes are carcinogenic; non-bold are non-carcinogenic
- EPA RSLs = Regional Screening Level for Industrial Soil for risk of 10^{-6} ; non-carcinogenic RSLs are for Hazard Quotient of 0.1
- Gray shaded values exceed the RSL

TABLE NO. 5
RESULTS OF ANALYSES OF SURFICIAL SOIL SAMPLES - METALS
4327 GUSTINE AVENUE
ST. LOUIS, MISSOURI

ANALYTE	D - 1	D - 2	D - 3	D - 4	D - 5	RSLs
	0' - 3'	0' - 3'	0' - 3'	0' - 3'	0' - 3'	
Arsenic	6.79	6.60	5.68	<2.50	8.62	0.16
Barium	55.8	31.6	191	129	185	190,000
Cadmium	0.44	0.60	0.71	0.47	0.15 J	800
Chromium	11.7	9.55	27.4	36.6	29.3	1,500,000
Lead	95.7	77.6	18.2	37.2	15.1	800
Selenium	<3.77	<4.00	<3.85	<4.00	<3.77	5,100
Silver	<0.94	<1.00	<0.96	<1.00	<0.94	5,100
Mercury	0.267	0.566	0.035	0.048	0.037	34

NOTES:

- All values are presented in mg/kg or parts per million ("ppm")
- Bold concentrations exceed the laboratory reporting limit or are estimated
- J = Analyte detected below the laboratory detection limit
- Bold analytes are carcinogenic; non-bold are non-carcinogenic
- EPA RSLs = Regional Screening Level for Industrial Soil for risk of 10^{-6} ; non-carcinogenic RSLs are for Hazard Quotient of 0.1
- Gray shaded values exceed the RSL

TABLE NO. 6
RESULTS OF ANALYSES OF SUBSURFACE SOIL SAMPLES - METALS
4327 GUSTINE AVENUE
ST. LOUIS, MISSOURI

ANALYTE	D - 1		D - 2		D - 3	RSLs
	4' - 8'	8' - 11'	0' - 3'	3' - 7'	3' - 5'	
Arsenic	2.66	2.3 J	6.60	7.70	10.4	0.16
Barium	243	214	31.6	138	170	190,000
Cadmium	0.31	0.11 J	0.60	9.63	1.49	800
Chromium	23.1	17.9	9.55	20.7	19.6	1,500,000
Lead	82.0	13.8	77.6	61.6	93.4	800
Selenium	<3.70	2.4 J	<4.00	<3.85	2.8 J	5,100
Silver	<0.93	<0.98	<1.00	<0.96	<0.98	5,100
Mercury	0.115	0.026	0.566	0.103	0.147	34

NOTES:

- All values are presented in mg/kg or parts per million ("ppm")
- Bold concentrations exceed the laboratory reporting limit or are estimated
- J = Analyte detected below the laboratory detection limit
- Bold analytes are carcinogenic; non-bold are non-carcinogenic
- EPA RSLs = Regional Screening Level for risk of 10^{-6} ; non-carcinogenic RSLs are for Hazard Quotient of 0.1
- Gray shaded values exceed the RSL

TABLE NO. 6 (continued)
RESULTS OF ANALYSES OF SUBSURFACE SOIL SAMPLES - METALS
4327 GUSTINE AVENUE
ST. LOUIS, MISSOURI

ANALYTE	D - 4				D - 5		RSLs
	0' - 3'	4' - 8'	8' - 12'	8' - 12' ("1")	4' - 8'	12' - 15'	
Arsenic	<2.50	5.12	4.15	3.22	10.1	4.18	0.16
Barium	129	169	228	203	132	105	190,000
Cadmium	0.47	0.15 J	0.49	<0.19	3.23	<0.19	800
Chromium	36.6	13.9	14.6	17.7	19.8	18.2	1,500,000
Lead	37.2	22.3	85.6	12.4	43.5	9.46	800
Selenium	<4.00	2.8 J	<3.92	<3.77	<4.00	<3.85	5,100
Silver	<1.00	<0.98	<0.98	<0.94	<1.00	<0.96	5,100
Mercury	0.048	0.033	0.017	0.015	0.148	0.012	34

NOTES:

- All values are presented in mg/kg or parts per million ("ppm")
- Bold concentrations exceed the laboratory reporting limit or are estimated
- J = Analyte detected below the laboratory detection limit
- Bold analytes are carcinogenic; non-bold are non-carcinogenic
- EPA RSLs = Regional Screening Level for Industrial Soil for risk of 10^{-6} ; non-carcinogenic RSLs are for Hazard Quotient of 0.1
- Gray shaded values exceed the RSL

EXHIBIT I

1 WHEREAS, the City of St. Louis does not use groundwater as a source for public
2 drinking water; and

3 WHEREAS, state law, regulation and policy allows for state-evaluated, risk-based
4 corrective action process for groundwater that is directed toward protection of human health and
5 the environment balanced with the economic welfare of the citizens of the state; and

6 WHEREAS, where public drinking water is available, the potable use of groundwater in
7 designated areas should be prohibited to protect public health and welfare when the quality of the
8 groundwater presents an actual or potential threat to human health; and

9 WHEREAS, the City of St. Louis desires to limit potential threats to human health from
10 groundwater contamination while facilitating the redevelopment and productive use of properties
11 that may be affected by such chemical constituents

12 **BE IT ORDAINED BY THE CITY OF ST. LOUIS AS FOLLOWS:**

13 **SECTION ONE.** For the purposes of this ordinance the following definitions shall
14 apply:

15 1. Person shall include any individual, partnership, co-partnership, firm, company,
16 limited liability company, corporation, association, joint stock company, trust, political
17 subdivision, or any other legal entity, or their legal representatives, agents or assigns.

18 2. Potable water means any water used or intended to be used for human or domestic
19 consumption, including, but not limited to use for drinking, bathing, swimming, washing dishes,
20 or preparing food.

July 13, 2005

Page 2 of 3

BB#190CS Sponsor: Ald. Wessels

1 **SECTION TWO.** Notwithstanding the provisions of any other ordinance, no person
2 shall use or attempt to use groundwater as a potable water supply.

3 **SECTION THREE.** No person shall drill or install wells to be used for a potable
4 water supply.

5 **SECTION FOUR..** Any active or inactive potable water wells found to exist
6 subsequent to the enactment of this ordinance shall be reported to the Missouri Department of
7 Natural Resources (MoDNR).

8 **SECTION FIVE.** The Mayor of the City of St. Louis, or his designee, is hereby
9 authorized and directed to enter into a Memorandum of Understanding with MoDNR for tracking
10 remediated sites, notifying MoDNR of changes to this ordinance, and taking certain precautions
11 regarding potable water supply wells, if any are found subsequent to the enactment of this
12 ordinance.

13 **SECTION SIX.** Any person convicted of violating this ordinance shall be fined not
14 more than five hundred dollars or imprisoned up to ninety days or by both fine and imprisonment
15 and shall be required to close the well(s) according to state standards under the Missouri Well
16 Construction Rules (10 CSR 23) or other applicable state or federal laws or regulations.

17 **SECTION SEVEN.** This being an ordinance for the preservation of public peace,
18 health and safety, it is hereby declared to be an emergency measure within the meaning of
19 Sections 19 and 20 of Article IV of the Charter of the City of St. Louis and therefore this
20 ordinance shall become effective immediately upon its passage and approval by the Mayor.

Clerk, Board of Aldermen

Clerk, Board of Aldermen


Approved

Q


Disapproved

Date _____

Date August 1, 2005


President, Board of Aldermen

President, Board of Aldermen



 Mayor

Mayor

Truly Engrossed and Enrolled

[Handwritten signature]

Chalman

1970-1971 141A12

STATE OF MISSOURI }
CITY OF ST. LOUIS }

ss

I, the undersigned Register
of said City do hereby certify the foregoing to be a true copy of

Ordinance 66777
Beard Bill # 190
Comm Sub.

the original of which is on file in this office.

Witness my hand and the seal of the City of St. Louis
this 23 day of March 2006

Darrie L. May
REGISTER

EXHIBIT II

SITE:

PHYSICAL AND CHEMICAL PROPERTIES OF CHEMICALS OF CONCERN

Chemicals of Concern	Water Solubility (S) [mg/L]	Henry's Law Constant (H) [L-water/L-air]	Org. Carbon Adsorption Coeff. (K _{oc}) [cm ³ /g]	Soil-Water Sorption Coeff. Vadose Zone (K _{sv}) [cm ³ -water /g-soil]	Soil-Water Sorption Coeff. Saturated zone (K _{ss}) [cm ³ /g]	Molecular Diffusion Coefficient		Saturated Vapor Pressure (P) [mm Hg]	Molecular Weight (MW) [g/g-mol]	Saturated Soil Concentration [mg/kg]
						in air (D ^a) [cm ² /s]	in water (D ^w) [cm ² /s]			
Benzo(a)anthracene	9.40E-03	1.37E-04	3.98E+05	2.39E+03	2.39E+03	5.10E-02	9.00E-06	1.54E-07	2.28E+02	2.24E+01
Benzo(a)pyrene	1.62E-03	4.63E-05	1.02E+06	6.12E+03	6.12E+03	4.30E-02	9.00E-06	4.89E-09	2.52E+02	9.91E+00
Benzo(b)fluoranthene	1.50E-03	4.55E-03	1.23E+06	7.38E+03	7.38E+03	2.26E-02	5.56E-06	8.06E-08	2.52E+02	1.11E+01
Benzo(k)fluoranthene	8.00E-04	3.40E-05	1.23E+06	7.38E+03	7.38E+03	2.26E-02	5.56E-06	9.59E-11	2.52E+02	5.91E+00
Chrysene	1.60E-03	3.88E-03	3.98E+05	2.39E+03	2.39E+03	2.48E-02	6.21E-06	7.80E-09	2.28E+02	3.82E+00
Dibenzo(a,h)anthracene	2.49E-03	6.03E-07	3.80E+06	2.28E+04	2.28E+04	2.02E-02	5.18E-06	2.10E-11	2.78E+02	5.68E+01
Indeno(1,2,3-cd)pyrene	2.20E-05	6.56E-05	3.47E+06	2.08E+04	2.08E+04	1.90E-02	5.66E-06	1.40E-10	2.76E+02	4.58E-01

NA: Not Available

The values in red are calculated.

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SITE:

TOXICOLOGICAL PROPERTIES OF CHEMICALS OF CONCERN

Chemicals of Concern	Slope Factor			Reference Dose			Absorbion Factor		Parameters for Dermal Contact Pathway				
	Oral (SF _o)	Inh. (SF _i)	Dermal (SF _d)	Oral (RfD _o)	Inh. (RfD _i)	Dermal (RfD _d)	Oral (RAF _o)	Dermal (RAF _d)	Dermal Permeability Constant (Kp)	Relative Contribution of Permeability Coefficient (B)	Lag Time (τ _{event})	Time to Reach Steady-State (t*)	Fraction Absorbed (FA)
	[kg-day/mg]	[kg-day/mg]	[kg-day/mg]	[mg/kg-day]	[mg/kg-day]	[mg/kg-day]	[--]	[--]	[cm/hr]	[--]	[hr]	[hr]	[--]
Benzo(a)anthracene	7.30E-01	3.90E-01	7.30E-01	NA	NA	NA	1	0.13	4.74E-01	2.752	2.033	8.527	1.000
Benzo(a)pyrene	7.30E+00	3.90E+00	7.30E+00	NA	NA	NA	1	0.13	7.01E-01	4.265	2.691	11.671	1.000
Benzo(b)fluoranthene	7.30E-01	3.90E-01	7.30E-01	NA	NA	NA	1	0.13	7.02E-01	4.289	2.772	12.027	1.000
Benzo(k)fluoranthene	7.30E-02	3.90E-01	7.30E-02	NA	NA	NA	1	0.13	8.69E-01	5.307	2.722	11.969	0.790
Chrysene	7.30E-03	3.90E-02	7.30E-03	NA	NA	NA	1	0.13	4.74E-01	2.752	2.033	8.527	1.000
Dibenzo(a,h)anthracene	7.30E+00	4.10E+00	7.30E+00	NA	NA	NA	1	0.13	1.51E+00	9.677	3.884	17.573	0.600
Indeno(1,2,3-cd)pyrene	1.20E+00	3.90E-01	1.20E+00	NA	NA	NA	1	0.13	1.00E+00	6.654	3.780	16.827	0.600

N/A: Not Applicable

NA: Not Available